



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF : Gerald Chip et al.
FOR : MODIFIED COPOLYMER LATEX BINDER
SERIAL NO. : 09/993,745
FILED : November 14, 2001
EXAMINER : BOYD, Jennifer
ART UNIT : 1771
LAST OFFICE ACTION : April 21, 2004
ATTORNEY DOCKET NO . : GT-5400
OMNZ 200051

Cleveland, Ohio 44114-2518

DECLARATION UNDER 37 C.F.R. §1.131

Mail Stop – No Fee
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

1. I, Gerald Chip, do hereby declare and say that I am a joint inventor in the above-identified United States patent application, Serial No. 09/993,745.

2. I have read and am familiar with the Office Action issued April 21, 2004 in connection with the above-identified United States patent application. I have further read and am familiar with U.S. Patent Publication No. 2002/0117279 to Wertz et al. (hereinafter "Wertz").

3. This Declaration is to establish reduction to practice of the invention in this application in the United States at a date prior to December 22, 2000, which is the effective date of Wertz. This Declaration is being submitted prior to a final rejection issuing in the above-identified patent application.

4. To establish reduction to practice of the invention at least prior to December 22, 2000, attached is a redacted copy of an invention proposal (3 pages) submitted to the Omnova Solutions Corporate Law Department (Exhibit A). I hereby declare and say that the relevant portions of Exhibit A predate December 22, 2000, the filing date of Wertz.

5. In particular, Exhibit A describes the present invention which comprises a stable aqueous binder composition containing a styrene/butadiene latex binder modified with a urea/formaldehyde resin and its use with polyester fiber mats. Manufacture of various working examples are provided showing the use of such binders made from Dynea UF resin 2023-30, which is a short stopped UF resin, and SB emulsion polymers in the use of polyester mat binders and improvements shown in hot dry elongation values over conventional binders.

6. Each date redacted in Exhibit A is at least prior to December 22, 2000, the effective date of the Wertz reference.

7. It is submitted that the information attached as Exhibit A clearly demonstrates reduction to practice of the inventive binder composition and mats made from the same in this country at a date at least prior to December 22, 2000.

8. It is submitted that the above information evidences a date of conception and reduction to practice of the claimed invention prior to December 22, 2000.

9. I hereby declare that all statements made herein are of my own knowledge and are true, and that all statements are made on information and belief and are believed to be true; and further that these statements were made with the

knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.



Gerald Chip

Date: July 8, 2004.



Data For Patents

Title of Invention Modified Styrene-Butadiene Binders for Use in Mat and Filtration ApplicationsInventor(s) Name Gerald Chip Chris WilkeyHome Address 760 Patriot Pkwy, #202 4718 Magnolia Ridge Dr(Street, City, Rock Hill WaxhawState & County) South Carolina 29730 North Carolina 28173Date Invention Conceived (Thought Of): [REDACTED]

Date of first:

a. Disclosure to others: [REDACTED] To Whom? Dave AndersonIf disclosed to another company, list company name. Noneb. Written Description [REDACTED]; Where is it? Laboratory Book # 3115c. Sketch or Drawing: None; Drawing No. [REDACTED] Where is it? [REDACTED]Date first tried out: [REDACTED]First trial witnessed by: G. Chip/C. Wilkey Assisted by: R. Estes

Is the invention being used (made, used or sold commercially) and, if not, when is such use expected?

List references to records (laboratory notebook and page, memos, reports, etc.), which substantiate the dates of conception, disclosure to others, written description, drawings, and trial or experiments and/or attach a copy of each of such records
Book # 3115, page 30Is further work underway or contemplated? Yes

ATTACH a description of the invention, including drawings or photographs, and a statement concerning the novel features thereof. The description should be sufficient to enable another person skilled in this art to make and use this invention.

Signature of Inventor(s) Gerald ChipChris WilkeySigned at Chester S.C.
(City) (County) (State)this [REDACTED] day of [REDACTED], [REDACTED]Witnessed by: Carolyn S. Clayton-SnipesDate: [REDACTED]

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Abstract

A stable aqueous binder composition containing a styrene/butadiene latex polymer modified with a urea/formaldehyde resin is used in the preparation of fiber mats used in the manufacture of polyester roofing industry.

Background and Prior Art

Polyester fiber mats are increasingly used in the building materials industry, as for example, in asphalt roofing shingles, replacing sheets made of wood or cellulosic fibers. The preferred binder used in the making of polyester mats has been to use either a vinyl-acrylic or an all acrylic emulsion, although recently, because of cost reduction, styrene-butadiene emulsions have been used. Good performance properties are obtained when these polymers are used as sole binder in the manufacture of roofing mats. However, there is a need in the industry to produce mats that have improved hot dry elongation as measured by tensile strength. We have found that by modifying the styrene-butadiene emulsion with a urea-formaldehyde resin, we get a minimum of 15% improvement in the hot dry elongation values. This improvement is enough to allow the mat manufacturer to increase his production line speed by 10% or more.

Summary of The Invention

The invention is directed to the use of an aqueous composition containing a stable styrene-butadiene latex modified with a urea formaldehyde resin to produce fiber mats that show improved hot dry properties compared to an unmodified styrene-butadiene polymer.

Composition of latex to UF resin ratio between 10-90 to 90-10 works equally well, with the preferred ratio being 70:30 latex to UF resin. Additionally, we have found that with the preferred composition, the mixture is usually unstable unless the pH of the composite is adjusted to between 7.0-8.0 by a non-volatile alkaline agent such as sodium hydroxide, although triethanolamine (TEA) is the preferred alkaline agent to use. If the pH of the mixture is adjusted with a volatile agent such as ammonia the resultant polymer tend to set up after only a few days, whereas if the pH is adjusted with TEA, the mixture is usually stable for over three months at ambient temperature with no apparent increase in viscosity.

The following examples are intended to illustrate the method for treating a flexible non-woven substrate to which this invention is directed. They are not intended to limit the invention as other applications of the invention will be obvious to those of ordinary skill in the art.

Example 1.

Preparation of aqueous admixture of Styrene/Butadiene (SB) emulsion polymers with Urea/Formaldehyde (UF) resins.

The SB latices used in this preparation are those manufactured by Omnova Solutions Inc., and include polymers containing self-crosslinking and/or hydroxy containing monomers.

The UF resin used in this preparation is identified as resin 2023-30 and is manufactured by Dynea Corp. (formerly Neste Resins).

Various blends of SB latices with UF resin, ranging from 90:10 to 50:50 were prepared but the preferred ratio is 70 parts latex to 30 parts resin based on dry weight. More than 50 parts of UF resin can result in coagulation of the blend.

Other additives may be added to this blend such as scavenger to reduce formaldehyde emission, anti-oxidant to prevent premature oxidation.

The pH of the blend is adjusted to 7.0-7.5 with a non-volatile alkaline agent, such as sodium hydroxide. Specially effective as alkaline agent are alkyl amines such as triethanolamine or dimethylethanolamine.